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FACIL:50-263 Monticello Nuclear Generating Plant, Northern States 05000263
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SUBJECT: LER 89-032-00:on 891025,partial primary containment isolation due to loose terminal connection.
W/8 ltr.

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A04

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November 22, 1989

Report Required by
10 CFR Part 50, Section 50.73

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Partial Primary Containment Isolation Due to
Loose Terminal Connection

The Licensee Event Report for this occurrence is attached.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50 Section 50.72 on October 25, 1989.

Thomas M Parker
Manager
Nuclear Support Services

c: Regional Administrator - III NRC
Sr Resident Inspector, NRC
NRR Project Manager, NRC
MPCA
Attn: Dr J W Ferman

Attachment

IE22
1/1

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
MONTICELLO NUCLEAR GENERATING PLANT	0 5 0 0 0 2 6 3	1 OF 0 4

TITLE (4)

Partial Primary Containment Isolation Due to Loose Terminal Connection

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
1 0	2 5	8 9	8 9	0 3 2	0 0	1 0	2 5	8 9		0 5 0 0 0

OPERATING MODE (8)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0 0		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Michael J. Langford, Senior I&C Engineer	6 1 2 2 9 5 - 1 1 3 1 2

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	
X	J M	R L Y	A 3 4 8	Y							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

With the plant shutdown for refueling, operators observed indication in the control room that the inboard main steam isolation valves had closed automatically. It was determined that a loose terminal screw had caused a loss of power to the AC solenoid operated air valves which when de-energized in conjunction with the DC solenoid operated air valves result in the main steam isolation valves closing. The DC solenoid operated air valves had earlier been de-energized by failure of a relay which was in the process of being repaired.

The loose terminal screw was tightened and the plant was returned to the condition existing prior to the event. The DC relay repair was completed. Other terminations in the panel containing the loose terminal screw were inspected prior to startup of the plant. The other division I panels are scheduled to be inspected during the next refueling outage. The service life of relays in safety related applications is under evaluation and replacement schedules will be determined. This event will be included in technical staff continuing training to increase the awareness of the need to promptly correct conditions that increase the vulnerability of safety related systems to single failures.

DESCRIPTION

At 0317 CDST on October 25, 1989, while the plant was shutdown for refueling, operators observed indication in the control room that the inboard main steam isolation valves (EIIS System Code: ISV)(MSIVs) had closed automatically. Operators also noted indication that the power for both the MSIV AC and DC solenoid operated air valves (EIIS Component Code: FSV)(SOAVs) was off.

Two sets of solenoid operated air valves, one AC powered and one DC powered, are provided to keep the MSIVs open. The primary containment isolation system (EIIS System Code: JM)(PCIS) de-energizes both sets of solenoid operated air valves resulting in the MSIVs closing. The purpose of two sets of valves is to provide redundancy and increased reliability of the MSIVs. Both sets of solenoid operated air valves must be de-energized to close the MSIVs to provide containment isolation.

Two days earlier, a DC relay (EIIS Component Code: RLY) had failed, de-energizing the DC powered solenoid operated air valves. On October 25, 1989 a loose terminal screw interrupted the neutral side continuity and de-energized the AC powered solenoid operated air valves, completing the conditions required to close the MSIVs. The terminal screw was tightened and the plant was returned to the conditions which existed prior to the event. This action was completed by 1030 CDST on October 25, 1989.

CAUSE

The root cause was a loose terminal screw in the neutral leg of the circuit supplying power to the AC powered solenoid operated air valves. The loose terminal screw interrupted power to the AC solenoid operated air valves which resulted in the MSIVs going closed. A search of maintenance and modification documents did not identify any work involving the loose terminal screw.

A contributing cause was failure of the DC relay in the circuitry energizing the DC powered solenoid operated air valves. Had either set of solenoid operated air valves remained energized, the MSIVs would not have closed. The failure of the DC relay is believed to be random. However, aging may be a factor since the relays have been normally energized for a number of years. Prompt corrective action was not taken to replace the DC relay, thereby restoring power to the DC power operated solenoid air valves, because MSIV operability was not required due to the plant being shutdown for refueling at the time. This allowed the isolation logic to be unnecessarily vulnerable to a single failure.

ANALYSIS

There were no consequences to the health and safety of the public as a result of this event. The plant was shutdown for refueling when the event occurred. All systems involved operated as designed. The plant was at all times in a stable condition. The MSIVs could not be opened until one set of the solenoid operated air valves had been restored to an operable condition. This presented no safety consequences.

This event would have been more severe if the MSIVs had closed while the plant was operating at rated power. However, MSIV isolation from full power is a previously analyzed event having no consequences to the public health and safety.

The plant was returned to pre-event status in approximately 6-1/2 hours.

CORRECTIVE ACTIONS

The cause of the loss of power to the AC solenoid operated air valves was the loose screw. The loose screw was tightened and the plant returned to the conditions which existed prior to the event.

Following determination of the cause of the event, the affected panel was inspected and all other terminal screws were found tight. Procedures had been previously written for preventive maintenance on all safety related panels. The preventive maintenance includes inspection and verification of wiring and terminations. Division II panels were inspected during this refueling outage. This event involved a Division I panel, which was subsequently inspected and no other loose terminals were identified. Based on the large population looked at as part of normal preventative maintenance practices and only a single occurrence of a loose terminal resulting in an interruption of continuity, this was judged to be a random incident. For this reason it was decided to keep the remaining Division I panels on a schedule which will result in their being inspected during the next refueling outage.

The failed DC relay contributing to this event was replaced. The service life of all relays in safety related applications is under investigation. This investigation will be completed and replacement schedules adjusted accordingly.

This event will be included in technical staff continuing training to increase the awareness of the need to promptly correct conditions that increase the vulnerability of safety related systems to single failures.

ADDITIONAL INFORMATION

Failed Component Identification

The failed relay was an Amerace/Agastat model EGPD001 with coil rating of 125 VDC.

Previous Similar Events

There have been no previous reportable events at Monticello involving a loose terminal screw or an Amerace/Agastat control relay.